

# Utah Diabetes Practice Recommendations Diabetes Management for Adults

Addendum  
October 2012



UTAH DEPARTMENT OF  
**HEALTH**

Diabetes Prevention & Control Program

## 2012 Update Contributors

Sarah Woolsey, MD, Chair  
Family Medicine  
Medical Director, HealthInsight

Barry Stults, MD  
Internal Medicine  
Department of Internal Medicine  
University of Utah

Robert E. Jones, MD  
Endocrinology  
School of Medicine  
University of Utah

Laura Shane-McWhorter, PharmD, BC-ADM, CDE  
Professor (Clinical)  
Department of Pharmacotherapy  
College of Pharmacy  
University of Utah

Jeffrey Dunn, PharmD, MBA  
SelectHealth  
Intermountain Healthcare

© 2012 Utah Diabetes Prevention and Control Program

All materials in this document may be reproduced with the suggested acknowledgment: Developed by the Utah Diabetes Prevention and Control Program, Utah Department of Health, in partnership with *HealthInsight*. This document was produced under Cooperative Agreement #1U58DP001993-01, Centers for Disease Control and Prevention, and by *HealthInsight* as part of the IC<sup>3</sup> Beacon Community, under Cooperative Agreement grant #90BC00006 from the Office of the National Coordinator, Department of Health and Human Services.

The contents of this document are solely the responsibility of the Utah DPCP and do not necessarily represent the official views of the Centers for Disease Control and Prevention.

# Summary of 2012 Updates

Diabetes care is an ever-evolving field and the members of the UDPR Panel strive to keep all information and recommendations current according to the most recent and accepted studies and findings. To provide the best available information, the UDPR are based on the American Diabetes Association Standards of Medical Care in Diabetes, current clinical best practices, and international and national studies that are widely accepted by diabetes professionals.

In this edition of the UDPR for Adults, the following updates have been added:

- **Diabetes Screening Protocol**

In the 2011 edition of the Standards of Medical Care in Diabetes, hemoglobin A1c (A1C), if measured by a certified lab following Diabetes Control and Complication Trial (DCCT) protocols, was added as a diagnostic tool. For 2012, the reliability of A1C as a screening test is being questioned in elderly patients, those with hemoglobinopathies and/or anemia, and some ethnic groups. Screening using this method may not be as reliable as a 2-hour glucose tolerance test (GTT).

- **Cardiovascular Disease:  
Aspirin Therapy**

Aspirin therapy is recommended to be individualized based on a patient's risk of all forms of cardiovascular disease. Updated recommendations are incorporated in the 2012 edition.

- **Hypertension Therapy**

The 2012 ADA guideline newly recommends administration of one or more antihypertensive agent(s) at bedtime. See the Cardiovascular section for details.

- **New Sections**

This edition of the UDPR has been expanded to include sections on Depression and Diabetes and Vaccine Administration.

- **Medication Summary**

Since the last edition of this UDPR, additional medications have been developed or changed to generic versions. These medications include: Linagliptin (Tradjenta), Exenatide ER (Bydureon), Sitagliptin/Metformin XR (Janumet XR), Linagliptin/Metformin (Jentadueto). Pioglitazone (Actos) is now available in generic form and pramlintide is sold only as SymlinPen. Dosage regimens of medications commonly used in the treatment of diabetes are found in Appendix C.

- **New Tools**

A variety of clinical and patient-education tools have been integrated into this document as embedded Web links and in the appendix. Resources for providers include chronic kidney disease assessment and treatment algorithms, referral forms for diabetic eye exams and tobacco cessation, and a comprehensive foot exam form. Patient handouts cover foot care, self-monitoring of blood glucose, and nutrition.

# CVD Overview: Aspirin Recommendations

Table: Aspirin Recommendations for Patients with No History of CVD or at Increased Risk of Bleeding (No history of prior gastrointestinal bleeding, no prior peptic ulcer disease, or no concurrent warfarin/NSAID therapy)			
Recommendation Based on Calculated 10-year CVD Risk*			
Aspirin should be <b>avoided</b>			< 5% risk
Aspirin may be <b>considered</b>			5-10% risk
Aspirin is <b>reasonable</b>			> 10% risk
* Risk may be calculated at <a href="http://zunis.org/FHS_CVD_Risk_Calc_2008.htm">http://zunis.org/FHS_CVD_Risk_Calc_2008.htm</a> or <a href="http://www.dtu.ox.ac.uk/riskengine/index.php">http://www.dtu.ox.ac.uk/riskengine/index.php</a>			
<b>Note:</b> There is concern that these risk calculators may overestimate CVD risk in modern populations with diabetes that receive more intensive treatment of lipids and hypertension than in the 1990s.			
Recommendation Based on Patient Characteristics			
	Gender	Age	Risk factors**
Aspirin should be <b>avoided</b>	Male	≤ 50 years	none
	Female	≤ 60 years	none
Aspirin may be <b>considered</b>	Male	≤ 50 years	1
		> 50 years	none
	Female	≤ 60 years	1
		> 60 years	none
Aspirin is <b>reasonable</b>	Male	> 50 years	≥ 1
	Female	> 60 years	≥ 1
**Risk factors: smoking, hypertension, albuminuria, dyslipidemia, family history			
ASPIRIN DOSAGE RECOMMENDATION 75-162 mg/day			

# Diabetes and Hypertension

## Prevalence and Control

The overall prevalence of hypertension in diabetes patients stabilized over the past decade, but hypertension control rates did *not* improve over this period and remain disappointingly low. Comparing data from 2001 to 2008, the National Health and Nutrition Examination Survey (NHANES) found that the prevalence of hypertension in diabetes—defined in this study as  $\geq 140/90$  mmHg rather than  $\geq 130/80$  mmHg—remained stable at about 68% (79% in blacks and 61% in Hispanics). The exception was a dramatic increase in hypertension prevalence from 27% to 43% in persons with diabetes aged 20-44 years, possibly driven by the obesity epidemic. Just 54% of persons with diabetes and hypertension (52% of blacks and 45% of Hispanics) have their BP controlled to  $<140/90$  mmHg, let alone to  $<130/80$  mmHg.<sup>9</sup> These continued poor hypertension control rates, which are worse in racial and ethnic minorities, are of particular importance since new data demonstrate that excess cardiovascular risk in diabetes is driven primarily by hypertension rather than by hyperglycemia or dyslipidemia.<sup>10</sup> Aggressive management should allow at least 70% of persons with diabetes and hypertension to have their BP controlled below 130/80 mmHg.<sup>11</sup>

## Diagnosis

Because of the frequent occurrence of white-coat hypertension (elevated office BP but normal out-of-office BP) and the reverse phenomenon, masked hypertension (high normal office BP but elevated out-of-office BP), out-of-office BP measurement with either 24-hour ambulatory BP monitoring (ABPM) and/or standardized home BP monitoring (HBPM) is a stronger predictor than office BP of future adverse cardiovascular and renal events.<sup>12,13</sup> White coat hypertension has a prognosis similar to that of normotension, while masked hypertension has an adverse prognosis nearly equivalent to sustained hypertension.<sup>12,13</sup> Current national and international guidelines therefore favor the use of out-of-office BP monitoring to detect these phenomena and accurately confirm the diagnosis of hypertension in many patients.<sup>14-17</sup> In contrast, the 2012 ADA guideline continues to recommend that the diagnosis of hypertension be made on the basis of carefully measured BP  $\geq 130/80$  mmHg on two office visits.<sup>18</sup> The ADA discourages the use of ABPM and HBPM, citing the relatively limited data using these modalities to diagnose hypertension in persons with diabetes. See algorithm, page 20.

## Therapeutic Goal

Optimal goal BP in persons with diabetes remains uncertain in 2012. An “individualized” approach continues to be recommended by the most recent clinical guidelines from the American Diabetes Association (2012)<sup>1</sup>, American Association of Clinical Endocrinologists (2011)<sup>2</sup>, and the Canadian Hypertension Education Program (2011)<sup>3</sup>: (1) Target BP  $< 130/80$  mmHg for most patients (2) Lower or higher target BPs for selected patients, although specific target BPs and selection criteria are not fully detailed in these guidelines.

A target BP  $< 130/80$  mmHg may be particularly considered in subgroups of persons with diabetes and hypertension: (1) a target systolic BP  $< 120-130$  mmHg in patients at high risk of stroke, including patients with a prior stroke or TIA, family history of stroke, known severe ( $> 70\%$ ) carotid stenosis,

**BP Goals for Persons with Diabetes**

	Office, mmHg	Home, mmHg
Most patients with diabetes	$<130/80$	$<130/80$
Selected patients (see Annotation 3 below)	$<140/90$	$<135/85$

*Unfortunately, only 50% of hypertensive men and just 42% of hypertensive women who have diabetes currently have their BP controlled to  $<130/80$  mmHg; however, control rates of nearly 70% have been achieved in clinical trials (eg., the ACCOMPLISH and GEMINI trials) utilizing aggressive management strategies.*

## Hypertension

or on anticoagulation therapy with an increased risk of intracerebral hemorrhage<sup>4</sup> (2) a target systolic BP < 130/80 mmHg in patients with GFR < 45-60 ml/min/1.73m<sup>2</sup> and albuminuria > 300-1000 mg/day.<sup>5</sup> The American College of Cardiology/American Heart Association 2011 guidelines on hypertension in the elderly suggest a target systolic BP of 140-145 mmHg in octogenarians.<sup>6</sup> Finally, a BP < 115/70 should be avoided in patients with type 2 diabetes, hypertension, and coronary heart disease.<sup>7,8</sup>

### References

1. American Diabetes Association. Standards of medical care in diabetes—2012. *Diabetes Care* 2012; 35(Suppl 1): S11-S63.
2. Handelsman Y, Mechanick JI, Blonde L, et al. AACE Task Force for developing a diabetes comprehensive care plan: AACE Diabetes Care Plan Guidelines. *Endocrine Practice* 2011; 17(Suppl 2): 3-53.
3. Canadian Hypertension Education Program. The 2011 Canadian Hypertension Education Program Recommendations for the management of hypertension: blood pressure measurement, diagnosis, assessment of risk, and therapy. *Can J Cardiol* 2011; 27:415-433.
4. Genuth S and Ismail-Beigi F. Clinical implications of the ACCORD Trial. *J Clin Endocrinol Metab* 2012; 97: 41-48.
5. Upadhyay A, Earley A, Haynes SM, et al. Systematic review: blood pressure target in chronic kidney disease and proteinuria as an effect modifier. *Ann Intern Med* 2011; 154:541-548.
6. Aronow WS, Fleg JL, Pepine CJ, et al. The ACCF/AHA 2011 expert consensus document on hypertension in the elderly: a report of the American College of Cardiology Foundation Task Force on Clinical Expert Consensus Documents. *Circulation* 2011; 123:2434-2506.
7. Cooper-Dehoff RM, Gong Y, Handberg EM, et al. Tight blood pressure control and cardiovascular outcomes among hypertensive patients with diabetes and coronary artery disease. *JAMA* 2010; 304:61-68.
8. Redon J, Mancia G, Sleight P, et al. Safety and efficacy of low blood pressures among patients with diabetes: subgroup analyses from the ONTARGET Trial. *J Am Coll Cardiol* 2012; 59:74-83.
9. Wang J, Geiss LS, Cheng YJ, et al. Long-term and recent progress in blood pressure levels among U.S. adults with diagnosed diabetes, 1988-2008. *Diabetes Care* 2011; 34:1579-1581.
10. Chen G, McAlister FA, Walker Rh, et al. Cardiovascular outcomes in Framingham participants with diabetes: the importance of blood pressure. *Hypertension* 2011; 57:891-897.
11. ACCORD Study Group. Effects of intensive blood pressure control in type 2 diabetes mellitus. *N Engl J Med* 2010; 362:1575-1585.
12. O'Brien E. Twenty-four-hour ambulatory blood pressure measurement in clinical practice and research: a critical review of a technique in need of implementation. *J Intern Med* 2011; 269: 478-495.
13. Stergiou GS, Parati G. Home blood pressure monitoring may make office measurements obsolete. *J Hypertens* 2012; 30:463-465.
14. Pickering TG, Miller NH, Ogedegbe G, et al. Call to action on use and reimbursement for home blood pressure monitoring: a joint scientific statement from the American Heart Association, American Society of Hypertension, and Preventive Cardiovascular Nurses Association. *Hypertension* 2008; 52:1-9.
15. Krause T, Lovibond K, Caulfield M, et al. Management of hypertension: summary of NICE guidance. *BMJ* 2011; 343:d4891.
16. Head GA, Mcgrath BP, Mihailidou AS, et al. Ambulatory blood pressure monitoring in Australia: 2011 consensus position statement. *J Hypertens* 2012; 59: 129-135.
17. Canadian Hypertension Education Program. The 2011 Canadian Hypertension Education Program recommendations for the management of hypertension: blood pressure measurement, diagnosis, assessment of risk, and therapy. *Can J Cardiol* 2011; 27:415-433.
18. American Diabetes Association. Standards of medical care in diabetes—2012. *Diabetes Care* 2012; 35(Suppl 1): S11-S63.

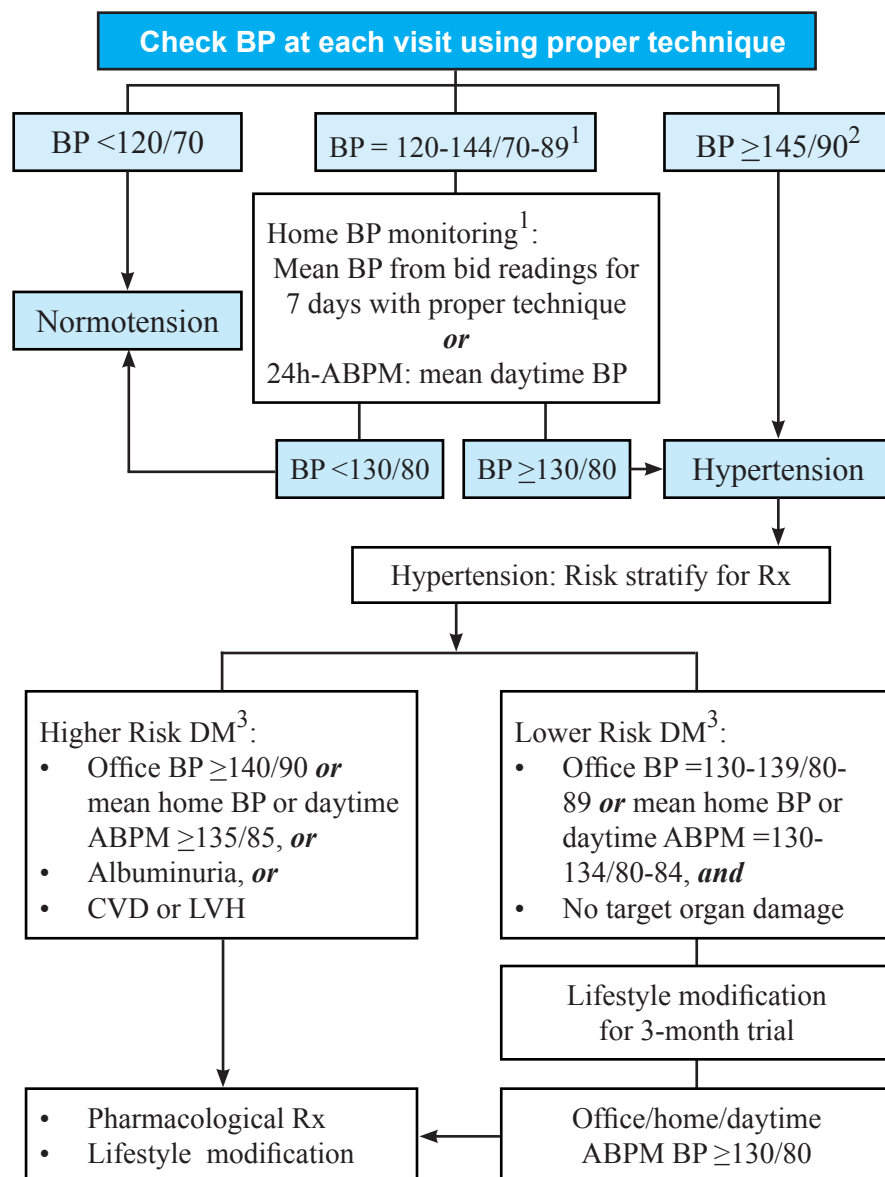
### A Note on Proper Technique

**Most errors in BP measurement technique falsely elevate BP.**

**Use of proper technique may lower BP by 10/5 mmHg:**

1. Rest 5 minutes, seated, back supported, feet flat on the floor.
2. No conversation.
3. Use correct cuff size (based on cuff bladder); 50% of adults require a large adult cuff.
4. Place cuff at mid-sternal level with the bladder centered over the brachial artery.
5. Deflate the cuff ≤2-3 mmHg per second.
6. If the first measured BP is ≥130/80 mmHg, repeat it twice at 1 minute intervals; ignore the first reading, which tends to be falsely high, and average the last two readings to better approximate usual BP.
7. Measure standing BP to detect orthostatic hypotension that may limit therapy.





Modified From: *Diabetes Care* 2012; 35 (Suppl 1): S11; *Can J Cardiol* 2010; 26:241

## Annotations

1. Out-of-office BP monitoring to detect the 30-40% of persons with white-coat or masked hypertension, particularly using the more expensive and less available ABPM approach, is not feasible for all persons with diabetes. A study of 554 subjects with diabetes found that 90% of persons with a *carefully measured* office BP  $< 120/70$  mmHg also had a mean daytime BP  $< 130/80$  mmHg on an ABPM study, confirming normotension.<sup>1</sup> Similarly, 90% of persons

with a *carefully measured* office BP  $\geq 145/90$  mmHg had a mean daytime BP  $\geq 130/80$  mmHg on an ABPM study, confirming a diagnosis of hypertension. However, 38% of patients with office BP between 120-144/70-89 mmHg would be *misclassified* as either normotensive or hypertensive if out-of-office BP monitoring were not utilized.<sup>1</sup> This study proposed a new algorithm to more accurately confirm the diagnosis of hypertension in persons with diabetes.<sup>1</sup> In the

Figure, their algorithm is modified slightly to incorporate use of HBPM when ABPM studies are not available. Similarly, the 2011 American Association of Clinical Endocrinologists Diabetes Comprehensive Care Plan suggests consideration of an annual ABPM study to detect white-coat and masked hypertension as well as elevated nocturnal BP in persons with diabetes.<sup>2</sup>

2. However, new 2012 studies provide evidence to support the increasing use of out-of-office BP monitoring in persons with diabetes. A study of ABPM in 12,600 persons with diabetes and hypertension found a prevalence of white-coat hypertension of 33%<sup>3</sup> while another study of 554 persons with diabetes noted prevalences of white-coat hypertension in 20% and of masked hypertension in another 10%.<sup>1</sup> Furthermore, as compared to persons with hypertension only, those with hypertension and diabetes are significantly more likely to have elevated nocturnal BP, the strongest BP predictor of adverse cardiovascular and renal outcomes in hypertensive populations with and without diabetes.<sup>3,4</sup> These new studies further suggest that the current target office BP of 130/80 mmHg for persons with diabetes corresponds to a mean daytime BP from an ABPM study of 130/80 mmHg,<sup>1,4</sup> and with less certainty, to a mean home BP of 130/80 mmHg (based on 7 days of twice-daily readings). Earlier studies previously demonstrated that a target office BP of 140/90 mmHg corresponds to a mean daytime BP of 135/85 mmHg from either an ABPM study or from standardized HBPM for 7 days.<sup>5</sup>
3. The decision as to when to initiate pharmacologic therapy for hypertension in diabetes should reflect whether the patient has “higher risk” diabetes with a BP  $\geq$ 140/90 mmHg or albuminuria ( $\geq$ 30 mg/g of creatinine) or other target organ damage (TOD); TOD includes clinical CVD, left ventricular hypertrophy (LVH), or an estimated GFR below 60 mL/min/1.73m<sup>2</sup> (calculated from the patient’s serum creatinine, age, sex, and race at [www.kidney.org/professionals/kdoqi/gfr\\_calculator.cfm](http://www.kidney.org/professionals/kdoqi/gfr_calculator.cfm)).

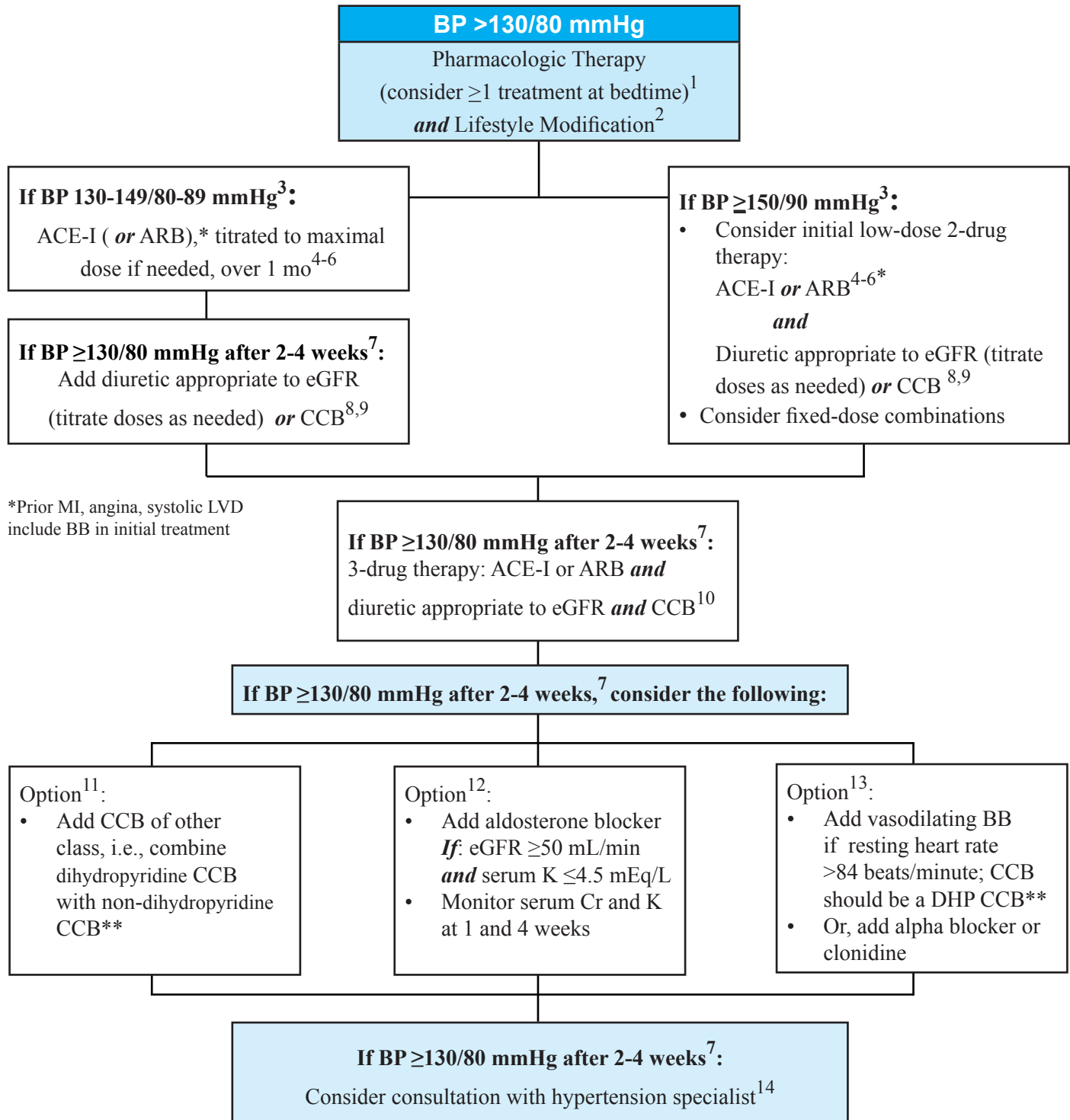
“Higher risk” diabetes patients should have a diagnosis of hypertension confirmed by 2 visits  $\leq$  one month apart, at which time simultaneous pharmacologic and lifestyle modification therapy should be initiated; controlling BP to goal within six months in such high risk patients has been shown to reduce cardiovascular disease events by about 25%. “Lower risk” diabetes patients with BP =130-139/80-89, no albuminuria, and no TOD may have a limited 3-month trial of lifestyle modification therapy after which pharmacologic therapy should be initiated if BP remains  $\geq$ 130/80 mmHg.

### References

1. Leita CB, Rodriques TC, Kramer CK, et al. Which patients with diabetes should undergo ambulatory blood pressure monitoring? *J Hypertens* 2011; 29:236-241.
2. American Association of Clinical Endocrinology Task Force. AACE Diabetes Care Plan Guideline. *Endocrine Practice* 2011; 17(Suppl 2):3-53.
3. Gorostidi M, de la Sierra SA, Gonzalez-Albarran O, et al. Abnormalities in ambulatory blood pressure monitoring in hypertensive patients with diabetes. *Hypertens Res* 2011; 34:1185-1189.
4. Cardeso CR, Leite NC, Muxfeldt ES, and Salles GF. Thresholds of ambulatory blood pressure associated with chronic complications in type 2 diabetes. *Am J Hypertens* 2012; 25:82-88.
5. Pickering TG, Miller NH, Ogedegbe G, et al. Call to action on use and reimbursement for home blood pressure monitoring: a joint scientific statement from the American Heart Association, American Society of Hypertension, and Preventive Cardiovascular Nurses Association. *Hypertension* 2008; 52:1-9.



# Management of Hypertension in DM



\*Prior MI, angina, systolic LVD  
include BB in initial treatment

\*\*Dihydropyridines (DHP) include: amlodipine, bepridil, felodipine,  
isradipine, nifedipine, and nisoldipine.

Non-dihydropyridines (non-DHP) include: diltiazem and verapamil.

Modified From:

*Diabetes Care* 2012; 35(Suppl 1) and *Journal of Clinical Hypertension* 2008; 10:707

# New Annotation for Hypertension

1. The 2012 ADA guideline newly recommends administration of  $\geq 1$  antihypertensive agent(s) at bedtime.<sup>1</sup> This recommendation is supported by considerable evidence. 24-hour ABPM studies have demonstrated that in normal subjects mean asleep BP declines by  $\geq 10\%$  relative to mean daytime BP and to levels  $< 120/70$  mmHg.<sup>2</sup> Persons whose asleep BP declines to normal levels are often referred to as “dippers,” while those whose asleep BP fails to decline by  $\geq 10\%$  or even rises are called “non-dippers.” Large, prospective observational studies and systematic reviews using ABPM have consistently shown that the mean asleep BP is a stronger predictor of major cardiovascular events than either the mean daytime or mean 24-hour BP in persons with and without diabetes.<sup>3-5</sup> As a result, non-dippers have a more adverse cardiovascular prognosis than dippers. While 40-50% of patients with uncomplicated hypertension exhibit a non-dipping asleep BP, 50-80% of persons with diabetes, chronic kidney disease, or autonomic nervous system dysfunction appear to have this pattern.<sup>6-8</sup> A recent prospective clinical trial of 2,156 subjects with hypertension randomized them to either receive all of their hypertension medications in the morning or at least one of them at bedtime; all patients had a baseline 24-hour ABPM study and then serial ABPM studies during 5.6 years of follow-up.<sup>9</sup> Bedtime administration of  $\geq 1$  antihypertensive medication significantly lowered mean asleep BP and mean 24-hour BP (no change in mean daytime BP) and significantly reduced the prevalence of non-dipping pattern from 62% to 34%. After 5.6 years of follow-up, the bedtime administration of  $\geq 1$  antihypertensive medication reduced total cardiovascular events by 61%. There were similar significant reductions in asleep BP, non-dipping pattern, and major cardiovascular events in the subgroup of 448 subjects with hypertension and type 2 diabetes<sup>10</sup> and the

subgroup of 661 subjects with hypertension and chronic kidney disease.<sup>11</sup> Each 5 mmHg reduction in asleep systolic BP significantly reduced cardiovascular events by 12% and 14%, respectively, in these two studies.<sup>10,11</sup> Decreasing the asleep BP appears to be the strongest predictor for reducing cardiovascular events in persons with diabetes.<sup>12</sup> Because of nighttime and early morning activation of the renin-angiotensin-aldosterone system, bedtime administration of ACE inhibitors and angiotensin receptor blockers appears to be particularly effective in reducing the prevalence of the non-dipping pattern.<sup>13</sup> Based on these data, the 2011 American Association of Clinical Endocrinologists Diabetes Comprehensive Care Plan now suggests consideration of an annual ABPM study to assess hypertension control in patients with hypertension and diabetes.<sup>14</sup> The ADA 2012 guideline appears to suggest the empiric administration of  $\geq 1$  antihypertensive agent(s) at bedtime.<sup>1</sup>

## References

1. American Diabetes Association. Standards of medical care in diabetes – 2012. *Diabetes Care* 2012; 35(Suppl 1): S11-S63.
2. Pickering TC, Hall JE, Appel LJ, et al. AHA Scientific Statement: recommendations for blood pressure measurement in humans. *Hypertension* 2005; 45:142-161.
3. Fan HQ, Li Y, Thijs L, et al. International Database on Ambulatory Blood Pressure in Relation to Cardiovascular Outcomes Investigators: Prognostic value of isolated nocturnal hypertension on ambulatory measurement in 8711 individuals from 10 populations. *J Hypertens* 2010; 28:2036-2045.
4. Hansen TW, Li Y, Boggia J, et al. Predictive role of nighttime blood pressure. *Hypertension* 2011; 57:3-10.
5. Eguchi K, Pickering TG, Hoshida S, et al. Ambulatory blood pressure is a better marker than clinic blood pressure in predicting cardiovascular events in patients with/without type 2 diabetes. *Am J Hypertens* 2008; 21:443-450.

6. Hermida RC, Calvo C, Ayala D, et al. Relationship between physical activity and blood pressure in dipper and non-dipper hypertensive patients. *J Hypertens* 2002; 20:1097-1104.
7. Gorostidi M, de la Sierra A, Gonzalez-Albarran O, et al. Abnormalities in ambulatory blood pressure in hypertensive patients with diabetes. *Hypertens Res* 2011; 34:1185-1189.
8. Minutolo R, Agarwal R, Borrelli S, et al. Prognostic role of ambulatory blood pressure measurement in patients with non-dialysis kidney disease. *Arch Intern Med* 2011; 171:1090-1098.
9. Hermida RC, Ayala DE, Mojon A, Fernandez JR. Influence of circadian time of hypertension treatment on cardiovascular risk: results of the MAPEC study. *Chronobiol Int* 2010; 27:1629-1651.
10. Hermida RC, Ayala DE, Mojon A, Fernandez JR. Influence of time of day of blood pressure-lowering treatment on cardiovascular risk in hypertensive patients with type 2 diabetes. *Diabetes Care* 2011; 34:1270-1276.
11. Hermida RC, Ayala DE, Mojon A, Fernandez JR. Bedtime dosing of antihypertensive medications reduces cardiovascular risk in CKD. *J Am Soc Nephrol* 2011; 22:2313-2321.
12. Hermida RC, Ayala DE, Mojon A, Fernandez JR. Sleep-time blood pressure as a therapeutic target for cardiovascular risk reduction in type 2 diabetes. *Am J Hypertens* 2012; 25:325-334.
13. Hermida RC, Ayala DE, Fernandez JR, et al. Circadian rhythms in blood pressure regulation and optimization of hypertension treatment with ACE inhibitor and ARB medications. *Am J Hypertens* 2011; 24:383-391.
14. American Association of Clinical Endocrinology Task Force. AACE Diabetes Care Plan Guideline. *Endocrine Practice* 2011; 17(Suppl 2):3-53.

# Healthy Eating with Diabetes

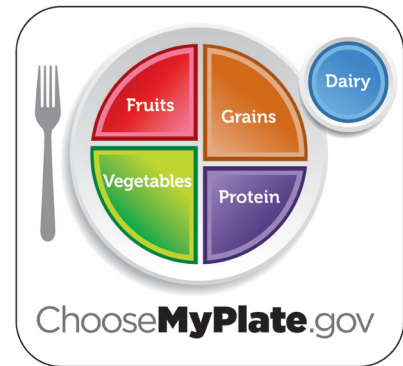
While there is no such thing as a “diabetic diet,” but people with diabetes need to be especially careful about what they eat. There are many eating plans available, but the best one is the one that fits your medications, lifestyle, and needs. One of the most important things you can do to eat healthy and control your diabetes is to meet with a Registered Dietitian and/or Certified Diabetes Educator who can help you learn to make good food choices. Most insurance plans cover this.

## Tips for Healthy Eating:

- Choose fresh fruits and vegetables most often
- Avoid sugary drinks like soda, punches, sports drinks, and juice
- Be aware of portion sizes!
  - A serving of carbohydrate is a half-cup or about the size of a tennis ball. Depending on your personal needs, you may have 2-5 such portions at each meal or for a snack. A dietitian or diabetes educator can help you find out how many carbohydrate servings you need.
  - A serving of meat for the main meal is the size of a deck of cards. You may want to have a portion this size with your main meal of the day. Having less at other meals may be better for you.

Here are some eating plans that may help you.

**MyPlate:** The online program at [ChooseMyPlate.gov](http://ChooseMyPlate.gov) can help you create a personal nutrition plan, set your goals, and track your progress. [ChooseMyPlate.gov](http://ChooseMyPlate.gov) includes tools to track your physical activity, too. Use the tools on this website to learn how to read labels. You can also get daily healthy-eating tips. There is even a BMI calculator to help you measure your success.



**Carbohydrate Counting:** Many people with diabetes have successfully controlled their blood sugar by counting carbohydrates (or “carbs”). Carbohydrates are found in most foods. Carbohydrates are often classified as “simple” or “complex.” That has to do with how easily your body breaks them down and releases them into your blood. Eating a meal or snack that is high in simple carbs can quickly raise your blood sugar and raise it too high. Carb counting allows you to plan your meals based on the amount and type of carbohydrates you eat so that your blood sugar level is more constant. Keeping your blood sugar level more constant is an important part of controlling your diabetes. Carb counting is easy to do, but can be tricky to learn. The best way to learn this skill is to meet with a Registered Dietitian and/or Certified Diabetes Educator. These online resources may help you:

- <http://www.diabetes.org/food-and-fitness/food/planning-meals/>
- [http://www.dlife.com/diabetes/information/food\\_and\\_nutrition/diet\\_and\\_carb\\_counting.html](http://www.dlife.com/diabetes/information/food_and_nutrition/diet_and_carb_counting.html)

# Healthy Eating with Diabetes: Plate Method

The Plate Method shows you about how much you need to eat of different types of food to lose weight and keep carbohydrate amounts and blood sugar constant. Not all dinner plates are the same size! You might want to consider using a smaller plate (9" diameter) to help you control your portions.

Here's what to put on your plate:

- Fill about half of your plate with non-starchy vegetables. There are so many non-starchy vegetables to choose from: broccoli, spinach, lettuce, zucchini, tomatoes, peppers, onions are a few examples. These are very low in calories and carbohydrates. They're also high in important nutrients.
- Fill about one-quarter of your plate with carbohydrates from grains (preferably whole grains) and starchy vegetables. Starchy vegetable such as potatoes, corn, beans (except green beans) and winter squash go on this part of your plate. Fruit and dairy food are also carbohydrates and may go here, see the next note.
- Depending on personal needs, some people will also have a serving of dairy, fruit, or even a small amount of sweets in addition to the carbohydrate portion of the plate.
- Fill the last quarter of your plate with lean protein like seafood, lean beef, tofu, poultry, and eggs. For your main meal, the serving size should be about 3 to 4 ounces. Less or sometimes no meat is usually better for the other meals. This depends on your weight and other factors.
- If you use fats, mainly use healthy fats such as olive, canola, or peanut oil and products made from them. But, only use a little as they are high in calories!

